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Indian Standard

IS 12000 (Part 2) : 2019

छपाई उद्योग में कागज नुकसान और अपव्यय के लिए गाईड

भाग 2 वेब ऑफसेट प्रक्रियाएँ

Guide for Paper Spoilage and Wastage for Printing Industry

Part 2 Web Offset Processes

ICS 37.100.01

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुरशाह ज़फर मार्ग, नई दिल्ली-110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI-110002
www.bis.org.in www.standardsbis.in

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FOREWORD

This Indian Standard (Part 2) was adopted by the Bureau of Indian Standards on the recommendation of the Publication and Graphic Technology Sectional Committee and approval of the Management and Systems Division Council.

In printing, binding and other post-press operations, some extra paper are needed over and above the base quantity of printable papers to allow for make-ready in respect of proper ink density and proper registration matching, spoilage for subsequent printing and other finishing operations etc. The quantity will depend upon the number of colours, quality of job, length of run, etc and it would include additional allowance for post-press operations like paper forwarding, online gluing, cutting, stitching and other binding operations etc.

Usually before the job is ready for continuous running, some copies are usually spoiled during the process of make-ready. Once the machine is set in motion, possible wastage of paper during printing process is considerably reduced and is limited to certain mechanical or printing defects/deficiencies and/or adjustments on machines or use of materials like ink, paper, plates, etc. Adequate quality control measures, proper maintenance of machinery and competent workers are the key factors which reduce wastage of paper to the absolute minimum under normal conditions. In colour work, the allowance must be sufficient to cover wastage due to misregister, improper ink density causing defective colour, set off, etc, resulting in requirement of additional paper over and above the base (printable) quantity.

Besides the above, web (reel) gets damaged due to handling during the course of transit from the suppliers to the printers, during storage and paper issuance from Godown to production floor. Therefore, proper packaging and handling of reels is a must to minimize the waste percentage.

It is necessary to have standard norms for arriving at the admissible spoilage or wastage that has to be allowed for various printing and production jobs which at present is based only on understanding between the print buyers and print sellers (printers).

This standard IS 12000 ‘Guide for paper spoilage and wastage for printing industry’ is published in two parts. The other Part in this series is:

Part 1 Sheetfed letterpress and offset processes

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of analysis shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding off numerical values (*revised*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

GUIDE FOR PAPER SPOILAGE AND WASTAGE FOR PRINTING INDUSTRY

PART 2 WEB OFFSET PROCESSES

1 SCOPE

1.1 This standard prescribes the minimum overs that should be added to the base (printable) quantity of paper needed for a particular job to be printed through web offset machine.

1.2 This wastage formula may vary for paper below 45 gsm for web offset machine.

1.3 The wastage report details are based after monitoring the working of newspaper industry as well as publication houses having web offset machines.

2 TERMINOLOGY

2.1 Wastage — Extra quantity of paper required, over and above the actual quantity to be printed.

2.2 Make-ready — Process of setting up a printing machine for proper positioning of the printing image on paper to print, uniform impression, colours registration and substance of paper to be used etc, prior to actual run of the job.

2.3 Fixed Wastage — The wastage of paper involved in make-ready process prior to actual running of the job.

2.4 Running Wastage — The wastage of paper which occurs during continuous printing of the job subsequent to make-ready due to operation, mechanical or electrical problem or power failure.

2.5 Base Quantity — The exact weight/quantity of paper required for executing the job, excluding the wastage.

2.6 Cold Start — After make-ready operation, initial starting of machine starts for printing.

2.7 Warm Start — Starting of machines, when it had stopped in between the printing operation, due to some technical reason.

2.8 Quality Work — Work of high quality, which requires accurate registration, sharpness and high colour consistency through-out the print run.

2.9 Fountain Solution — Chemical used to strengthen the dampening solution by controlling its *p*H, conductivity, surface tension etc.

2.10 Dampening Solution — Water used on plate's non-image area during offset printing mixed with fountain solution.

3 TYPES OF WASTAGE IN WEB OFFSET PRESS

3.1 Printed Waste

Copies getting waste during printing for achieving good copies in respect of ink density and colour registration.

3.2 Cut Waste (Tear Off)

Top most layer of newsprint reel which, if damaged due to side cut or small holes, needs to be removed from the reel.

3.3 Sweeping

Extra paper gets wasted during printing due to web break and failure of auto splicing.

3.4 Wrapper

The thick top and side cover used to protect the reel during transportation.

3.5 Core (Reel End)

The cylindrical hard material placed in center of reel, used to wind newsprint to make reel.

3.6 Rewinding Waste

Paper wastage during rewinding of small reels, which is left after partial use of full reels.

4 FACTORS AFFECTING PRINT WASTE

a) Cold start waste;
b) Warm start waste;
c) Improper machine settings;
d) Ink water balance;
e) *p*H and conductivity of dampening solution;
f) Unfixed web path;
g) Web breaks;
h) Any scheduled or unscheduled stoppages;
j) Registration control system;
k) Number of reel changes;
m) Press run sequence; and
n) Improper making of plates.

5 FACTOR AFFECTING CUT WASTE (TEAR OFF)

a) Improper wrapping of reels;
b) Transportation related problem;
c) Improper storage;
d) Mishandling during loading and unloading;
NOTE — This could by forklift operator, unskilled and untrained labour, etc.
e) Skill or mindset of press operators;
f) Storage of partially used reels on production floor;
g) Cleanliness and condition of reel issuing bay;
h) Condition of forklift pad; and
j) Pressure setting of forklift pad.

6 DIFFICULTIES IN WASTAGE CONTROLLING

6.1 Multiple Suppliers of Reel

The paper (reels) supplied by multiple vendors are varying in terms of brightness, tensile and bursting strength, K&N density and *p*H value, Opacity, LAB Values etc. Since the quality of reels in such cases is not same, it poses difficulty in controlling wastage.

6.2 Storage at Multiple Warehouses

Most of the warehouses do not have facilities for controlling temperature and relative humidity, which is essential for maintaining the desired moisture level of web reels.

6.3 Reel Handling

Proper reel handling is essential to avoid ovality of core and protection from any side cuts etc.

6.4 Lack of Trained Manpower for Reel Handling

Most of the labours working for loading and unloading of web reels are not technically trained for handling of reels.

6.5 Ageing Problem of Paper

At times due to the inability of the organization to maintain First-in First-out system (FIFO), wastage of paper occurs due to ageing problem.

7 WAYS FOR CONTROLLING WASTE

7.1 Using Webs with High Mileage (Bigger Size)

Mostly webs have 1 m diameter. The reel-stand should be customized in such a way that they can handle webs upto 1.25 m diameter resulting in reduction in schedule breakdowns for the machine having no ARC (Automatic reel changer).

7.2 Technical Training to Supporting Staff

Providing proper technical training for loading, unloading and stacking of web reels to labour, contractors and others.

7.3 Auto Reel Changer (ARC)

Scheduled stoppages due to change in webs can be minimized by using ARC. Number of stoppages is directly proportional to wastage.

7.4 Auto Registration System for Early Colour Matching

By using auto registration system, operator can focus on other web control activities. This results in speedy production of good copies and enhanced client satisfaction.

7.5 Taking-off of Reel Wrapper

The paper reel wrapper should be taken off after loading the reels on reel stand to minimize wastage of paper.

7.6 Re-packing Half Used Reels

After using of reels, partially used reel must be re-packed with wrappers instead of leaving them exposed in open.

7.7 Proper Make-ready of Machines

Before running the machine operator should always cross-check rollers settings, ink releasing key openings, amount of ink charged, path of web etc.

7.8 Using of R.O. Water

Water is an important subtract used in offset printing. It will be desirable to use R.O. water to achieve better *p*H and conductivity value of dampening solution.

7.9 Proper Dosing of Fountain Solution

To reduce printed waste, the proper strength of dampening solution that is *p*H should be around 4.0 (tolerance ±0.2) and conductivity should be 1 300 µs (tolerance of ±100).

8 ALLOWABLE WASTAGE FOR WEB OFFSET PRESS

Heat-set web offset machine:

Printed + White wastage	:	Minimum of total 2 percent for 4 colour and 1 percent for single colour printing subject to minimum 400 copies and 200 copies respectively.
Tear wastage	:	0.4 percent

Sweep waste	: 0.25 percent
Core	: 0.60 percent
Wrapper	: 0.75 percent

The wastage depends on quantity of job, machine length and splicing facility of machine. The above norms are applicable for minimum quantity of 20 000. Percentage will differ if print order is increased or decreased, but the printed wastage copies would be same, as mentioned above.

Cold-set web offset machine:

Printed + White wastage	: Minimum of total 1.5 percent for 4 colour and 1 percent for single colour printing subject to minimum of 300 copies and 200 copies respectively.
Tear wastage	: 0.4 percent
Sweep waste	: 0.25 percent
Core	: 0.60 percent
Wrapper	: 0.75 percent

The wastage depends on quantity of job, number of reels used for job, machine length and splicing facility of machine. The above norms are applicable for minimum quantity of 20 000. Percentage will differ if print order is increased or decreased, but the printed wastage copies would be same, as mentioned above.

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act*, 2016 to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards : Monthly Additions'.

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Amendments Issued Since Publication

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BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 2323 0131, 2323 3375, 2323 9402 *Website*: www.bis.org.in

Regional Offices: *Telephones*

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002 — 2323 7617, 2323 3841

Eastern : 1/14 C.I.T. Scheme VII M, V. I. P. Road, Kankurgachi, KOLKATA 700054 — 2337 8499, 2337 8561, 2337 8626, 2337 9120

Northern : Plot No. 4-A, Sector 27-B, Madhya Marg, CHANDIGARH 160019 — 26 50206, 265 0290

Southern : C.I.T. Campus, IV Cross Road, CHENNAI 600113 — 2254 1216, 2254 1442, 2254 2519, 2254 2315

Western : Manakalaya, E9 MIDC, Marol, Andheri (East), MUMBAI 400093 — 2832 9295, 2832 7858, 2832 7891, 2832 7892

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